

Weekly Report for 05/18/2015

Highlights

- Convened Injector Working Group meeting, presented introduction, and led discussion. (Kathy Harkay)
- Organized and participated in SCU1 commissioning, which was completed successfully. (Kathy Harkay)

APS Renewal and Upgrade

- Proposed multiple ionization as an explanation for the saturation observed in our PAR ion tune shift measurements. Developed a simple analytical model that agrees qualitatively with the data. Started working on incorporating this effect into the ion simulation code. (Joe Calvey)
- Studied the effect of exciting the beam (to measure its tune) on ion trapping. Showed a significant amount of ions can be lost during the excitation. Plan to investigate this by measuring the effect of chirp strength on the measured tune. (Joe Calvey)
- Showed that, according to both theory and simulation, no ion trapping is expected in the APS-U storage ring. (Joe Calvey)
- Discussed inconsistencies in Microwave Studio calculations with M. Sangroula and R. Lindberg. (Joe Calvey)
- Attended initial MBA injector meeting and physics meeting. (Jeff Dooling)
- MOGA optimization of upgrade lattice with reverse bends. (Yipeng Sun)
- New MOGA scripts development. (Yipeng Sun)
- Presented introduction for Injector Working Group kick-off meeting, in consultation with CY Yao. Organized table of present limits and list/status of physics issues. Convened meeting and led discussion. (Kathy Harkay)
- Discussed Booster instability simulation with R. Lindberg. (Kathy Harkay)
- Provided text for responses to two MAC review recommendations (re injectors for M. Borland and re ray tracing/vacuum for H. Cease). (Kathy Harkay)

MCR Operations

Storage Ring Operations

- Reviewed the SCU1 alarm handler and requested some changes. Found additional medm screens which needed updating and requested an ACO to do them. (Karen Schroeder)
- Updated SR RF 352-MHz Operational Limits and sent to Horan for any Booster changes or additional SR changes. Gave to MCR once this was done. (Karen Schroeder)
- Measured optimum BM1 vertical steering and provided this to A. Xiao for incorporation into UBOP. (Kathy Harkay)
- Collected all the signatures on the SCU1 Commissioning checklist. (Kathy Harkay)
- Uploaded into ICMS documentation on SCU1 ray tracing (from installation and physics reviews). (Kathy Harkay)

Linac Operations

- Injector start-up - (Stan Pasky)
- Tune tested the 3G3 gun followed by rf conditioned and cathode activation and beam studies. As a result new reference files have been made for operations of RG1 and RG2. (Stan Pasky)
- Supported RF group to find proper modulator trigger timing for optimum operation as well as RF Gate Start and Gate Width. (Stan Pasky)
- Reinstalled diodes in laser heads and returned heads to the regen cavity. (Jeff Dooling)
- Did not obtain lasing at 200 A of pump current but only attempted minimal alignment (used only alignment template). (Jeff Dooling)
- Added aluminized mylar coating to the inner surface of the laser head cover to increase pump light on the rod. (Jeff Dooling)
- Note: pump light only covers 16 mm of the 58 mm of rod length within the pump chamber. Spreading light more efficiently could reduce the overall pump current requirements. (Jeff Dooling)
- Measured PC voltages; found the peak voltage amplitudes were 2.4 kV and 2.7 kV on PC2 and PC1 respectively. (Jeff Dooling)
- According to S. Edstrom, these levels are too low; should be 4.0-4.2 kV. (Jeff Dooling)
- Edstrom will send a new HV power supply for the PCs. (Jeff Dooling)

Procedures

- Provided comments on "APS Linac/PAR ACIS Interlock Bypass to Support In-Tunnel APS Photoinjector Low Power Laser Optics Alignment" procedure. This procedure will allow a low-power laser (Class II) to operate during Authorized Access as well as Controlled Access for alignment support. (Stan Pasky)
- As Critical Component System Manager I reviewed and commented on a revised policy and procedure for configuration management of radiation safety shielding and injector components. (Stan Pasky)

MCR Operations administrative/misc.

- Produced the Draft 2015-3 Run for the Long-Range schedule and sent to Jaje to be included in the OPS Directorate meeting notice. Completed the draft FY 2016 to ensure we could get 5000 User Hours with 2015-3 schedule as is. (Karen Schroeder)
- Produced the SR A-E, SR F tunnel closure checklists, MPS validation sign-off sheets, Top-up sign-off sheets and BPLD validation list for start-up purposes. Sent out tunnel closure notices (Karen Schroeder)
- Led daily 4 o'clock meetings in MCR (Karen Schroeder)
- Attended OPS Directorate and gave updates of state of shutdown, tunnel closures, etc. (Karen Schroeder)
- Reviewed and approved non-RSS SR work requests (Karen Schroeder)

APS Machine Studies

Storage Ring Studies

- Tested SCU1 fast FO BLMs. Presently have a single 61-fiber bundle on the US ID and two 7-fiber bundles in the SCU1 cryostat. (Jeff Dooling)
- Initial tests show the outside ("o") bundle is responding to injection and beam dump losses; however the inside ("i") is not. (Jeff Dooling)
- Conducted SCU1 quench studies with K. Harkay. (Jeff Dooling)
- Produced the beam related portion of the studies schedule. Updated the machine studies schedule as needed (Karen Schroeder)
- Co-ordinated studies with 1-ID beamline for check-out of SCU1. (Karen Schroeder)
- Co-ordinated studies at 24-ID for Bingxin Yang to test Compton Xbpms with shutters open. (Karen Schroeder)
- Co-ordinated additional SCU1 testing with MD group and MCR. (Karen Schroeder)
- Prepared for storing first beam for studies, generated RF conditioning schedule, gave instructions to MCR for same. Signed off for S39 ACIS flag, Top-up current monitor low limit and MPS dump enable based on current. (Karen Schroeder)
- Gave instructions to MCR for top-up verification studies, monitored and made some adjustments. (Karen Schroeder)
- Edited SCU0 scripts for beam-based chamber alignment for SCU1. (Kathy Harkay)
- Organized SCU1 commissioning schedule. (Kathy Harkay)
- Reviewed SCU1 commissioning plan with studiers (part of checklist). (Kathy Harkay)
- Participated in SCU1 commissioning. (Kathy Harkay)
- Participated in abort kicker studies with J. Dooling (joined by A. Zholents). Acquired FPGA turn-by-turn BPM histories. (Kathy Harkay)

PAR Studies

- Measured beam size in the PAR (and PTB), as well as booster injection efficiency, as a function of bunch charge. (Joe Calvey)
- Assisted CY Yao with his booster machine studies- measuring the charge dependent tune shift, and improving injection in DC mode. (Joe Calvey)

APS Machine Research and Development

Storage Ring Research and Development

- Discussed abort kicker controls requirements, medm screens, and testing with F. Lenszus and J. Wang. (Kathy Harkay)
- Discussed how we should do the HP radiation survey for the abort kicker studies with J. Dooling and J. Vacca. Postponed the survey so that it can be scheduled after business hours. We agreed to limit the kicked beam to 1 mA until the survey is done. (Kathy Harkay)

PAR Research and Development

- Continued to work with the vacuum group on improving our model of the PAR vacuum. We are

meeting this week to discuss installing an RGA there. (Joe Calvey)

Linac Research and Development

- Delivered laser coolant water sample to D. Graczyk (NE) in 205 on Wednesday; obtained results Friday. (Jeff Dooling)
- Water pH was found to be 4.76; significant amounts of Cu and Zn were found in the water indicating material on the rod surface is probably not organic but rather a copper compound (Cu is an algaecide). (Jeff Dooling)

APS Machine Software

Storage Ring

- discussed with Louis and Marty, decide to create symbolic gap for SCU1 (ID01ds) to work in the way as before to minimize the software changes. Requested Marty to add the missing pvs back for SCU1. Updated the gap scan script to work with this changes. (Hairong Shang)
- modified makeSBPMWaveformReqFile: added filter -match=par,BPMTType=FPGA to filter out Booster bpms, and added changing directory for SCR request file directory to be able to run at other places.. (Hairong Shang)

Injectors

- CY could not review the par scope data, debugged par scope save restore software and found there were empty files which caused the problem, removed the empty files and fixed the problem. (Hairong Shang)
- debugged APSMpBoosterPSSetFullPower pem which could not bring up SD ramp, ran and stuck at APSMpParallel, killed pem and restarted the it, it ran through without problems, no errors found. (Hairong Shang)
- Preparing for booster orbit response matrix measurement (it is complicated, each bpm has 10 time segmentation, the corrector ramp should be changed by the time segment too): wrote SetBoosterSingleBumpAmplitude to change the ramp amplitude for given corrector at given time ramp, and wrote checkAndLoadBoosterBump to monitor booster corrector ramp amplitude and load it once it changes. (Hairong Shang)
- Updated the LPL PEMtool for Start-Up. (Stan Pasky)

General

- added par ION gauge PVs to par-let vaccum logger per CY"s request. (Hairong Shang)
- updated source point parameters table on AOP webpage through running latex2html command manually. The webpage had not been updated since July, 2014. (Hairong Shang)
- parVAC stopped logging since May 7, checked and studied how to debug dataloggers and restarted data loggers, wrote an elog for this process for reference of debug and re-start datalogger. (Hairong Shang)
- added SCU1 alarm logger, used OAG122RC control for SCU1 alarm logger. Wrote a technical note on how to add alarm loggers. (Hairong Shang)
- added SCU1 vaccum pvs to SRvac.mon per Kathy's request. (Hairong Shang)
- updated MM1.mon per PS group's request. (Hairong Shang)

- merged setupCherenkovSR with DIAG group's private version. (Hairong Shang)

Publications, papers and report

- Published three papers for IPAC2015. (Yipeng Sun)

Meetings, workshops, conferences, committees, LMS related, and reviews

- Attended - (Stan Pasky)
- The first, kick-off meeting of the Injector Working Group Fri, May 22. (Stan Pasky)
- The goals of the group are - (Stan Pasky)
 - 1. Understand the root causes of injector limitations related to the requirements of the APS upgrade. (Stan Pasky)
 - This will involve theoretical, experimental, and simulation work. (Stan Pasky)
 - 2. Chart a cost- and resource-efficient path toward resolving these limitations. Prepare and present (Stan Pasky)
- proposals for improvements to ASD and APS-U management. (Stan Pasky)
- The Review Meeting on Linac Structures is scheduled for Today, Thursday, May 28, 2015, in Conference Room B4100. (Stan Pasky)
- Purpose was to discuss alignment methods, structure support, and installation schedule. (Stan Pasky)
- As member of the ASRC, attended presentation of updated 211 SAD for upgraded chemistry electron linac presented by S. Chemerisov. Comments on SAD are requested by J. Cross by COB June 2nd. (Jeff Dooling)
- Attended meeting to discuss study plan for SCU1 operation with Users during machine studies (Karen Schroeder)

Safety and Required Training

- Two training courses. (Yipeng Sun)

Miscellaneous

- Locked out 35-ID's gap motor control because PS1 shutter is closed and cannot be validated. Gave the information to Diagnostics Group and Shang altered multiple PEMS so they would function while the motor control is disabled. (Karen Schroeder)
- Completed the list of work done in the SR during shutdown and sent to appropriate personnel. (Karen Schroeder)